

REMARKS/ARGUMENTS

Status of Claims

Claims 1 to 46 are currently pending in the application.

Amendments to Claims

Claim 1 has been amended to include a limitation that the backhaul network comprises “backhaul network nodes comprising”.

A further limitation has been added to claim 1, specifically “wherein there are no active wireless connections between backhaul network nodes of a same type, at a same level of the hierarchical topology”. This limitation is supported by the description of the present application from page 20, line 19 to page 21, line 8.

Claims 5, 8, 15, 21, 22, 24 to 26, 33 to 35, 38 to 41, 44 and 45 have been amended by replacing the term “adapted” with the term “configured”.

Claim Objections

The Examiner has objected to claims 5, 8, 15, 21, 22, 24 to 26, 33 to 35, 38 to 41, 44 and 45 based on use of the expression “adapted to”. Applicant has amended the claims by replacing the term “adapted” with the term “configured”, which Applicant submits provides a positive limiting effect to the claims language.

35 U.S.C. § 102 Rejections

Controlling case law has frequently addressed rejections under 35 U.S.C. § 102. “For a prior art reference to anticipate in terms of 35 U.S.C. Section 102, every element of the claimed invention must be identically shown in a single reference.” Diversitech Corp. v. Century Steps, Inc., 850 F.2d 675, 677, 7 U.S.P.Q.2d 1315, 1317 (Fed. Cir. 1988; emphasis added). The disclosed elements must be arranged as in the claim under review. See Lindemann

Machinefabrik v. American Hoist & Derrick Co., 730 F.2d 1452, 1458, 221 U.S.P.Q. 481, 485 (Fed. Cir. 1984). If any claim, element, or step is absent from the reference that is being relied upon, there is no anticipation. Kloster Speedsteel AB v. Crucible, Inc., 793 F.2d 1565, 230 U.S.P.Q. 81 (Fed. Cir. 1986; emphasis added). The following analysis of the present rejections is respectfully offered with guidance from the foregoing controlling case law decisions.

The Examiner has rejected claims 1 to 4, 15, 16, 33 and 34 under 35 U.S.C. 102(e) as being anticipated by Wolfe et al. (US Patent Application Publication 2002/0159409).

The Examiner alleges that Wolfe et al. discloses “A multi-hop wireless backhaul network” based on mesh network 18 illustrated in Figure 1 of Wolfe et al. The Examiner alleges that Wolfe et al. discloses “at least one NAN (network access node)” in the form of mesh attachment points (MAPs) indicated by reference 20 in Figure 1 of Wolfe et al., “a plurality of BNs (base nodes)” in the form of mobile terminals indicated by reference 22 in Figure 1, and “a plurality of AGNs (aggregation nodes)” in the form of radio base stations (RBSs) of a second type, specifically “pico” RBSs, indicated by reference 16 in Figure 1. The Examiner further alleges that Wolfe et al. discloses each of the plurality of AGNs “performing a switching function in relaying traffic between at least one of the base nodes and at least one of the network access nodes” in paragraphs [0006] to [0008] and [0030] of Wolfe et al. and the limitation “wherein a hierarchical topology of active wireless connections is established with the at least one network access node at the top of the topology, and the base nodes at the bottom of the topology” in paragraph [0014] and Figure 1 of Wolfe et al.

The Examiner equates AGNs recited in claim 1 to RBS 16 disclosed in Wolfe et al., BNs recited in claim 1 to mobile stations 22 disclosed in Wolfe et al. and NANs recited in claim 1 to MAPs 20 disclosed in Wolfe et al. As a result of this equating of elements by the Examiner, the Examiner is defining that the mobile stations 22 and radio base stations 16 of Wolfe et al. are part of a backhaul network. Applicant submits that one skilled in the art would not consider elements in the downlink direction beyond the access points, i.e. mobile stations, as part of a backhaul network. As a particular example of a definition of backhaul, the Wikipedia website states “In a hierarchical telecommunication network the backhaul portion of the network comprises the intermediate links between the core, or backbone, of the network and the small

subnetworks at the "edge" of the entire hierarchical network. For example, while cell phones communicating with a single cell tower constitute a local subnetwork, the connection between the cell tower and the rest of the world begins with a backhaul link to the core of the telephone company's network".

Applicant submits that the Examiner has incorrectly characterized the elements of Wolfe et al. with regard to the elements in the "multi-hop wireless backhaul network" recited in claim 1.

In addition, based on the equating of elements that the Examiner has alleged, the limitations recited in amended claim 1 of each of the plurality of AGNs "wherein a hierarchical topology of active wireless connections is established with the at least one network access node at the top of the topology, and the base nodes at the bottom of the topology and there are no active wireless connections between backhaul network nodes of a same type at a same level of the hierarchical topology" can not be met by Wolfe et al., as will be detailed below.

Applicant submits that Wolfe et al. does not disclose the limitations recited in the present claims. Even if the Examiner were to allege that AGNs recited in claim 1 equate to MAPs 20 disclosed in Wolfe et al., BNs recited in claim 1 equate to RBSs 16 disclosed in Wolfe et al. and NAN recited in claim 1 equate to BSC 12 disclosed Wolfe et al., Applicant submits that such a combination would not meet the claim limitation "wherein a hierarchical topology of active wireless connections is established with the at least one network access node at the top of the topology, and the base nodes at the bottom of the topology; and wherein there are no active wireless connections between backhaul network nodes of a same type, at a same level of the hierarchical topology" (emphasis added). Such a combination is not equivalent to the limitations recited in claim 1 for the reason that the link between MAP 20 and BSC 12 is not a wireless link, but is instead a wired link. Furthermore, such a combination is not equivalent to the limitations recited in claim 1 for the reason that the radio base stations 16 disclosed in Wolfe et al. have communication links between nodes at a same level in the topology. For example, in Figure 1 of Wolfe et al., any of four RBSs wirelessly connected to either of two MAPs 20 illustrated in Figure 1, are capable of communication with a respective MAP 20 and at least two of the other three RBSs 16 communicating with the respective MAP 20. Since in each case the four RBSs

are all capable of communicating with the respective MAP 20, they are all at the same level of the topology. This is contrary to the recited limitation in claim 1.

In addition, on page 17 of the present application, the description recites “Conventional multi-hop wireless networks have typically been created for low-capacity, delay tolerant, short-haul data transport to/from consumer electronics and Local Area Network (LAN) and Wide Area Network (WAN) operations... conventional multi-hop wireless networks are based on data packet routing. Consequently, each node in a multi-hop wireless network is effectively a router that parses each data packet it receives to determine the data packet’s ultimate destination and then re-transmits the data packet as required. The routing functionality requirement alone makes each node relatively complex. Each node in a data packet’s path delays the arrival time of the data packet to its ultimate destination, since each node parses the data packet before it is re-transmitted. Such delays are tolerated because the data carried on conventional multi-hop wireless networks is expected to be delay tolerant. When considering the applicability to backhaul network design, such delays are not acceptable since circuit traffic is sensitive to timing” (emphasis added). Paragraph [0017] of Wolfe et al. discloses “The mesh 18 functions as an IP-based routing network, with each RBS 16 serving as both an access point for mobile terminals 22 operating within its coverage area and as a router within the mesh 18”. Applicant submits that the mesh network disclosed by Wolfe et al. is the type of network described in the present application leading to delays that are unacceptable.

For at least the above discussed reasons, Applicant submits that the Examiner has erred in equating the limitations recited in claim 1 with the elements disclosed in Wolfe et al.

As Wolfe et al. does not identically disclose all of the limitations of claim 1 for at least the reasons discussed above, Applicant submits that Wolfe et al. cannot anticipate claim 1 and therefore claim 1 is novel over Wolfe et al. Applicant respectfully requests that the Examiner reconsider and withdraw the 35 U.S.C 102 rejection.

Claims 2 to 4, 15, 16, 33 and 34 are dependent upon claim 1, either directly or indirectly, and for at least their dependence on claim 1, these claims should be allowable.

Furthermore with respect to claim 2, the Examiner has equated the access network nodes recited in claim 2 with the radio base stations 16 of Wolfe et al. As discussed above, the Examiner has also equated the aggregation node of claim 1 with radio base stations 16 disclosed in Wolfe et al. Applicant submits that the radio base stations 16 disclosed in Wolfe et al. cannot be considered as both the aggregation nodes as recited in claim 1 and the access network nodes recited in claim 2.

35 U.S.C. § 103 Rejections

In rejecting claims under 35 U.S.C. 103(a), the Examiner bears the initial burden of establishing a *prima facie* case of obviousness. *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992). *See also In re Piasecki*, 745 F.2d 1468, 1472 (Fed. Cir. 1984). It is incumbent upon the Examiner to establish a factual basis to support the legal conclusion of obviousness. *See In re Fine*, 837 F.2d, 1071, 1073 (Fed. Cir. 1988). In so doing, the Examiner is expected to make the factual determinations set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966), *viz.*, (1) the scope and content of the prior art; (2) the differences between the prior art and the claims at issue; and (3) the level of ordinary skill in the art. Additionally, in making a rejection under 35 U.S.C. 103(a) on the basis of obviousness, the Examiner must provide some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness. *KSR Int'l. Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741 (2007). Only if this initial burden is met does the burden of coming forward with evidence or argument shift to the appellant. *See Oetiker*, 977 F.2d at 1445. *See also Piasecki*, 745 F.2d at 1472. Obviousness is then determined on the basis of the evidence as a whole and the relative persuasiveness of the arguments. *See Oetiker*, 977 F.2d at 1445; *Piasecki*, 745 F.2d at 1472.

The Examiner has rejected claims 5 to 8, 12 and 13 under 35 U.S.C. 103(a) as being unpatentable over Wolfe et al. in view of Naudus (U.S. Patent No. 6,412,006).

The Examiner has rejected claims 9 to 11 under 35 U.S.C. 103(a) as being unpatentable over Wolfe et al. in view of Johansson et al. (U.S. Patent No. 7,058,050).

The Examiner has rejected claim 14 under 35 U.S.C. 103(a) as being unpatentable over Wolfe et al. in view of Naudus and further in view of Melpignano (U.S. Patent Publication No. 2005/0190700).

The Examiner has rejected claims 17 to 20, 35 and 41 to 44 under 35 U.S.C. 103(a) as being unpatentable over Wolfe et al. in view of Smith (U.S. Patent Publication No. 2004/0179555).

The Examiner has rejected claims 21 to 27 under 35 U.S.C. 103(a) as being unpatentable over Wolfe et al. in view of Ohara (U.S. Patent No. 5,495,472).

The Examiner has rejected claims 28 to 32 under 35 U.S.C. 103(a) as being unpatentable over Wolfe et al. in view of Ohara and further in view of Johansson et al.

The Examiner has rejected claims 36 to 40 under 35 U.S.C. 103(a) as being unpatentable over Wolfe et al. in view of Smith and further in view of Ohara.

The Examiner has rejected claims 45 and 46 under 35 U.S.C. 103(a) as being unpatentable over Wolfe et al. in view of Naudus and further in view of Smith.

Applicant submits that the Examiner has not properly determined the differences between the claimed invention and the prior art. Furthermore, the Examiner has not provided a valid explanation to support an obviousness rejection under 35 U.S.C. 103. Applicant's reasoning is detailed below.

Differences between the claimed invention and the prior art

The following is a discussion of how the cited references do not disclose all the elements of the rejected claim. While it may be considered that "the mere existence of differences between prior art and an invention does not establish the invention's non-obviousness", Office personnel must explain why the difference(s) between the prior art and the claimed invention would have been obvious to one skilled in the art (Examination Guidelines for Determining Obviousness Under 35 U.S.C. 103 in view of the Supreme Court Decision in *KSR International Co. v. Teleflex Inc.*, published in Federal Register Vol. 72, No. 195 October 10, 2007). As such,

if elements from a claim are not disclosed by the combination of cited references and no valid reasoning is provided why the missing elements would be obvious, this may provide a strong basis for why a claim should not be rejected based on obviousness.

All of the claims are dependent on claim 1, either directly or indirectly, and are rejected at least in part based on Wolfe et al. due to their dependence on claim 1 and the Examiner's allegation that Wolfe et al. anticipates claim 1. For at least the reasons discussed above, Applicant submits that Wolfe et al. does not identically disclose all the elements of claim 1. Applicant does not concede that the other cited references disclose the limitations missing from Wolfe et al. Therefore, as the Examiner has not provided evidence that Wolfe et al. and the various other cited references disclose the subject matter of claim 1 and/or that elements missing from any of the combinations would be obvious and why they would be obvious, there is a clear lack of at least one limitation in the combination of Wolfe et al. and the cited limitations when compared to the recited claims.

Explanation to support an obviousness rejection

As noted above, for the Patent Office to properly combine references in support of an obviousness rejection, the Patent Office must identify a reason why a person of ordinary skill in the art would have sought to combine the respective teachings of the applied references. However, for reasons detailed below, the Examiner's articulated reason can not be regarded as being valid.

The Examiner has at least in part based his reasoning for combining the references on the characterization of Wolfe et al., which Applicant submits for the reasons discussed above are incorrect.

Furthermore, as discussed above, Wolfe et al. is directed to a mesh network functioning as an IP-based routing network, with each RBS 16 serving as both an access point for mobile terminals 22 operating within its coverage area and as a router within the mesh 18. Such a network is inconsistent with a backhaul network claimed in the present application, for which delays are not acceptable in circuit traffic sensitive to timing. Therefore, Applicant submits that the subject matter of Wolfe et al. teaches away from the claimed invention.

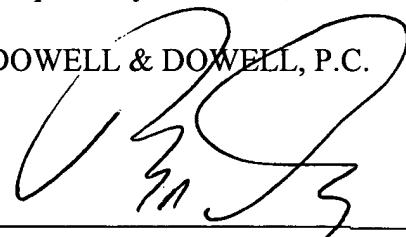
As Wolfe et al. does not disclose the limitation alleged to be disclosed by the Examiner and teaches away from the present application, Applicant submits that the Examiner has failed to provide a suitable reason for combining Wolfe et al. with the other cited references.

Applicant submits that the Examiner has failed to establish a *prima facie* case of obviousness for at least the above-discussed reasons. Therefore, claims 5 to 14, 17 to 32 and 35 to 46 of the present application are patentable over Wolfe et al. in combination with the particular cited references identified above. Applicant respectfully requests that the Examiner reconsider and withdraw the obviousness rejection of claims 5 to 14, 17 to 32 and 35 to 46.

In view of the foregoing, early favourable consideration of this application is earnestly solicited.

Respectfully submitted,

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